

What is claimed is:

- 5 1. A multicast-capable port for replicating multicast data packets comprising:
at least one ingress path into the port for receiving the data packets;
at least one egress path out of the port for outputting data packets; and
a multicast-capable component coupled to the egress and ingress paths of
the port, the multicast-capable component for replicating and readdressing the
replicated data packets;
- 10 characterized in that data packets assigned for multicasting arrive at the
port on the egress path and are diverted to the multicast-capable component,
wherein the packets are replicated or readdressed and output to the ingress path.
- 15 2. The multicast-capable port of claim 1, wherein the port is hosted on a card
within a data router.
- 20 3. The multicast-capable port of claim 2, coupled to other ingress/egress ports of
the card.
- 25 4. The multicast-capable port of claim 3, wherein more than one multicast-
capable port is mounted on a same card.
5. The multicast capable port of claim 2, wherein there are multiple cards within
the data router, individual ones of which host at least one multicast-capable port.
6. The multicast-capable port of claim 2, wherein the data router is connected to
other like data routers distributed over network topology and wherein individual

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ones of the multicast-capable ports associated therewith are responsible for a portion of a multicast project.

7. The multicast-capable port of claim 1, wherein the port is an integrated circuit.

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8. The multicast-capable port of claim 7, wherein the multicast-capable component is implemented as an integrated circuit externally from the port.

9. The multicast-capable port of claim 4, wherein there is a table containing instruction for multicasting, table entries being configured by software.

10. A multicast-capable fabric card within a data router comprising;

at least two ports coupled to each other by data paths; and

at least one multicast engine;

characterized in that data packets assigned for multicasting arrive at the multicast-capable fabric card and are delivered to the multicast engine wherein they are replicated and/or modified as needed for multicast and forwarded.

11. The multicast-capable fabric card of claim 10 coupled by port paths to other cards within the same router.

12. The multicast-capable fabric card of claim 10, wherein a switching facility is provided on the card, the switching facility for managing port-to-port communication.

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13. The multicast-capable fabric card of claim 10, wherein the multicast-capable port is an integrated circuit.

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14. The multicast-capable fabric card of claim 10, wherein there is a table containing instruction for multicasting, table entries being configured by software.

5 15. A multicast engine, comprising:

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1 one or more first ports for communicating with one or more second ports of one or switch elements; and
circuitry for modifying or replicating multicast packets routed to the engine;

10 characterized in that multicast packets received from the one or more fabric cards are replicated and/or modified as needed, and forwarded via the one or more first ports to one of the one or more of the second ports.

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15 16. A multicast-capable data router having a multicast-capable port for replicating multicast data packets, the port having at least one ingress path into the port for receiving the data packets, at least one egress path out of the port for outputting data packets, and a multicast-capable component coupled to the egress and ingress paths of the port, the multicast-capable component for replicating and re-addressing the replicated data packets;

20 characterized in that data packets assigned for multicasting arrive at the port and are diverted to the multicast-capable component, wherein the packets are replicated or re-addressed and forwarded.

25 17. The router of claim 16 wherein the multicast-capable component is integrated into the circuitry of the multicast-capable port.

18. The router of claim 16 wherein the multicast-capable port is a fabric card port.

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19. The router of claim 16 wherein the multicast-capable port is an external port.

20. The router of claim 16 further comprising a table containing instructions for multicasting.

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21. A multicast-capable data router having a fabric card comprising at least two ports coupled to each other by data paths, and at least one multicast engine; characterized in that data packets assigned for multicasting arrive at the fabric card and are delivered to the multicast engine wherein they are replicated and/or modified as needed for multicast and forwarded.

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22. The router of claim 21 wherein the multicast-capable component is integrated into the circuitry of the one of the ports of the multicast-capable fabric card.

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23. The router of claim 21 further comprising a table containing instructions for multicasting.

24. A multicast-capable data router, comprising a multicast engine having one or more first ports for communicating with one or more second ports of one or more fabric cards, and circuitry for modifying or replicating multicast packets routed to the engine:

characterized in that multicast packets received from the one or more fabric cards are replicated and/or modified as needed, and forwarded via one or more of the first ports to one or more of the second ports.

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25. The router of claim 24 wherein the multicast engine is integrated into the circuitry one of the ports of the fabric card.

26. The router of claim 24 further comprising a table containing instructions for multicasting.

27. A method for multicasting comprising steps of:

- (a) providing a plurality of multicast engines within a router, each having one or more first ports for communicating with second ports of the router;
- (b) receiving multicast packets at one of the second ports and sending the multicast packets to one of the multicast engines via the first ports;
- (c) replicating and/or modifying the data packets for multicasting according to tabled instructions associated with the multicast engine; and
- (d) forwarding the replicated or modified packets to individual ones of the second ports.

28. The method of claim 27 wherein the multicast engine is integrated as a part of a port of a line card in the router.

29. The method of claim 27 wherein the multicast engine is integrated as a part of a port of a fabric card in the router.

30. The method of claim 27 wherein the multicast engine is a stand-alone component and the second ports with which the first ports communicate are ports of one or more fabric cards in the router.

31. The method of claim 27 wherein, in step (a) there are a plurality of interconnected routers, individual ones having multicast engines, and wherein, in step (d), replicated or modified packets are forwarded to individual ones of the plurality of interconnected routers.

32. The method of claim 31 wherein the tabled instructions associated with individual multicast engines are updated periodically.